THINNING INSPECTION PLOT FORM

sheet ___ of ____

ID	(a) Forest	(b) District	(c) Stand #	(d) Inspector (Gov't)	(e) Date
Contract	(f) Contractor	(g) Sub-item #	(h) Acres	(i) % of Work Accomplished	
	(j) Contract #	(k) Contract Inspector		(l) % of Contract Time Left	

| Contract Specifications | (m) Acceptable tpa
___min/ ___max
___ avg. | (n) Accept. Trees/plot
___min/ ___max
___ avg, | (o) Avg Spacing
___ x ___
foot spacing | (p) Plot Size
1:___ or
1/___acre | (q) Min. Cut Ht
_____ in. | (r) Max. cut dbh
_____ in. | (s) Max. Cat C
_____ tpa |

Plot No. (1)	Code / Species — Tree Evaluation and Species / Species ? Tree was cut (2)		SATISFACTORY			DEFICIENCY				
			Satisfactory Leave Trees	Surplus Trees	Non-stocked points	Cat. "A" trees Improper Leave Tree Selection (Uncorrectable)		Cat. "B" trees Excess (Correctable)		Cat. "C" trees (Correctable)
	Codes ?		S1-S2 (3)	S3-S4 (4)	N1-N2 (5)	A1-A2 (6)	A3-A4 (7)	B1-B2 (8)	B3-B4 (9)	C1-C6 (10)
	1 2 3 4 5 6 7 8 9 10 11 12									

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

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Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

		Avg D.B.H. = ___ ";	Avg HT = ___ '	Cat. C tally:
Remarks:

(t) Thinning Quality Calculation		(3) Accept Leave	(4) Surplus	(5) Non-stocked	(6) Cat A	(7) Cat A	(8) Cat B	(9) Cat B	(10) Cat C
	Totals of this page								
	Total of all pages								

INSTRUCTIONS

1. Locate and mark plot center on the ground.
2. Locate and examine the trees selected for leave, and trees that are cut on the plot. Record the Evaluation Code for satisfactory trees and deficiencies (except Category C trees) in column 2 on the top line for the plot. If required, record the species for each tree in the second line for the plot.
3. Tally all Category C deficiencies and record in the space below Column 10. (Tally by code- i.e. C1, C2 C3)
4. Total the Acceptable Leave Trees coded S1, S2 in column 3. Total cannot exceed the max. trees per plot. If total exceeds the max/plot, re-code trees [i.e. surplus trees over max. DBH should be coded S3, trees to ignore should be coded S4. Excess Trees are a deficiency, Category B]. Refer to Block n for maximum trees per plot.
5. Total the surplus trees >max. d.b.h (S3) and trees to ignore (S4) and record in column 4.
6. Total the non-stocked points on the plot coded N1 and N2 and record in column 5.
7. Total the improper selection and cutting of trees (A1, A2) that should have been left; record in column 6.
8. Total the improper selection of leave trees (A3) or damage to leave trees (A4), record in column 7.
9. Total the trees that should have been cut (B1, B2), record in column 8.
10. If required, total the trees that should have been girdled or pruned or that were girdled or pruned incorrectly, record in column 9.
11. Total the Category C trees on the plot and record in column 10.
12. If required: estimate the average d.b.h and average height of the leave trees in the plot.
13. Remarks: include other required information
14. Total Columns 3-10 on each page, and provide the grand total of all pages on page 1.
15. After all plots have been conducted, calculate thinning quality using the total of all pages. Record in block t.

$$\% \text{ Quality} = 1.00 - \left(\frac{\text{Cat A deficiencies (col. 6 + col. 7) + Cat B deficiencies (col. 8 + col. 9)}}{\text{Acceptable Leave (col. 3) + Non-stocked points (col. 5)}} \right) \times 100$$

16. Determine if Cat C trees (col. 10) exceed the maximum allowed specified (block s).

$$\text{Cat C tpa} = \frac{\text{Total Col 10}}{\text{No. of plot}} \times \text{reciprocal of plot size}$$

TREE EVALUATION CODES

Satisfactory Leave Trees

- S1 (or ?) Leave Tree meets specifications
- S2 Tree left exceeds maximum d.b.h to cut, included in trees/plot calculation
- S3 Tree left exceeds maximum d.b.h to cut, not included in trees/plot calculation
- S4 Tree to be ignored, not included in trees/plot calculation.

Non-stocked areas

- N1 Opening, no tree exists
- N2 Opening created by cutting a tree with insect/disease or poor form.

Improperly cut trees: (Category A) Uncorrectable

- A1 Tree should not have been cut, tree met leave tree specifications.
- A2 Tree should not have been cut, tree exceeds max. d.b.h to cut
- A3 Leave tree damaged by thinning operations
- A4 Improper selection of leave tree (includes wrong species, undesirable tree, etc)

Excess Trees: (Category B) Correctable

- B1 Tree should have been cut to meet allowable stocking density, or is too close to leave tree.
- B2 Tree should have been cut because of damage, insect & disease or poor form.
- *B3 Tree should have been girdled or was girdled improperly (or Cat C5)
- *B4 Tree should have been pruned or was pruned improperly (or Cat C6)

Other Deficiencies: (Category C) Correctable

C1 Tree was not completely severed from stump	C4 Small tree
C2 Hang up tree	*C5 Tree should have been girdled or was girdled improperly (or Cat B3)
C3 High Stump	*C6 Tree should have been pruned or was pruned improperly (or Cat B4)

Additional Notes (local requirements, etc.)

If girdling or pruning is required, specify if trees not girdled/pruned or girdled/pruned improperly are considered a Cat B or Cat C deficiency prior to start work. Define a proportional value for each pruning deficiency if desired (i.e. 0.25 per deficiency)

DETAILED INSTRUCTIONS
TREE EVALUATION CODES

	Codes	Explanation
SATISFACTORY	**SATISFACTORY LEAVE TREES** The totals of S1 and S2 trees are used in the thinning quality calculation.	
	S1 or check mark	Acceptable tree; tree was left that met the leave tree specifications.
	S2	Tree was left that exceeds the maximum d.b.h. to cut, and the prescription/contract specified this tree counts in the acceptable trees per plot calculation when no tree within the thinning range exists.
	S3	Tree was left that exceeds the maximum d.b.h. to cut but is considered a surplus tree and is not included in the acceptable trees per plot. This value is important to record in order to calculate total trees per acre in the post treated stands. Refer to the prescription, which will specify if these larger trees are considered surplus in all cases, or only when there are sufficient trees within the thinning range to meet the allowable density.
	S4	Tree was left that was of the species or condition that was to be ignored; it is considered a surplus tree and not included in the acceptable trees per plot. This value is important to record as it is needed to calculate total trees per acre in the post treated stands.
	NON-STOCKED AREAS The totals of non-stocked areas are used in the thinning quality calculation.	
	N1	An opening exists on the plot where no tree exists. Recording this on the plot form justifies fewer than minimum trees on a plot.
	N2	An opening that was created by cutting a tree due to poor form, insect and disease or other conditions as required by the contract or prescription. Recording this gives credit for cutting a tree that should be cut even if it lowers the stocking below minimum levels.
DEFICIENCIES	**IMPROPERLY CUT TREES – CATEGORY A DEFICIENCIES** These deficiencies are uncorrectable and influence the thinning quality calculation. Regardless of the thinning quality, rework cannot be done to correct these problems.	
	A1	Tree was cut that should not have been; it that met all leave tree specifications, and did not exceed the maximum trees per plot.
	A2	Tree was cut that should not have been because it exceeded maximum d.b.h. to cut. This could instead be coded A1 but is more specific using this code.
	A3	Satisfactory leave tree was damaged in the thinning operations; may have been damaged during cutting, slash treatment or any aspect of the operations.
	A4	Wrong leave tree was left. It was the wrong species, a better tree existed in the spacing or competitive area, or similar reasons. Do not also code the tree that was incorrectly cut as a deficiency

	EXCESS TREES REMAIN – CATEGORY B DEFICIENCIES	
	These deficiencies are correctable and influence the thinning quality calculation. Reworking the area and cutting more trees can correct these errors.	
	B1	Tree met tree specifications but should have been cut to meet the allowable stocking density, or it was too close to a leave tree.
	B2	Tree should have been cut because of damage, insect and disease or poor form or otherwise indicated as a tree that is to be cut regardless of other trees on the plot. Refer to prescription for unacceptable levels of insect, disease or damage or the characteristics of other trees to be cut.
	B3	When girdling is required, this code indicates that a tree was not girdled or not adequately girdled that should have been. The prescription/contract must specify if this will be considered a B or C deficiency. As a B deficiency, there is less tolerance and will affect the quality calculation.
	B4	When pruning is required, this code indicates that a tree was not pruned or not adequately pruned that should have been. The prescription/contract must specify if this will be considered a B or C deficiency. As a B deficiency, there is less tolerance and will affect the quality calculation.

DEFICIENCIES

	OTHER DEFICIENCIES – CATEGORY C DEFICIENCIES	
	These include a variety of other discrepancies that generally can be corrected. The contract/prescription must specify the maximum C deficiencies that are allowed, after which rework is required. In general a greater number of these deficiencies can be allowed before it affects the overall results of the thinning activity, therefore there is some tolerance to a small number of these, particularly if there is a cost savings. Refer to contract for maximum Cat C deficiencies allowed. Recording the C deficiencies with a tally by type (i.e. C1, C2, etc) is desirable.	
	C1	Tree was not completely severed from the stump.
	C2	Tree was hung up in another tree or other debris.
	C3	The stump was higher than the maximum allowed.
	C4	A "small tree" was left. Small trees are defined by the contract/prescription and reflect those trees that are required to be cut but do not pose a strong competition to the larger trees.
	C5	When girdling is required, tree should have been girdled or was girdled improperly. The prescription/contract must specify if this will be considered a C or B deficiency. As a C deficiency, there is tolerance for errors within the stand.
	C6	When pruning is required, tree should have been pruned or was pruned improperly. The prescription/contract must specify if this will be considered a C or B deficiency. As a C deficiency, there is more tolerance for errors within the stand.

NOTES

		Evaluation Codes specific to other work required by the prescription/contract should be stated in this section, both deficiency and satisfactory codes. Additionally specify in this section if there are any deficiencies that will carry only a proportional value, for example "1/4 tree" for each pruning error.
		Thinning Inspectors should provide comments in this section relative to the overall stand condition, unusual or unique features or conditions observed, and other information that will be useful to the Government in evaluating the stand conditions.

INSPECTION PLOT FORM- DETAILED INSTRUCTIONS

HEADER INFORMATION BLOCK	EXPLANATION

STAND ID. GENERAL INFORMATION	
a,b,c	Stand information (blocks a, b, c) is provided in the Silvicultural Summary Prescription.
d	Name of inspector when the Government is performing the inspection. This may be an inspection or a quality assurance check.
e	Date of inspection, regardless of who is conducting the inspection.
CONTRACT INFORMATION	
f, g, h	Name of Contractor , sub item number, and acres in unit
i	% of work accomplished: useful if this is a midway quality evaluation, however the unit quality is based on the completion of all plots in the unit or sub item. $$\frac{\text{acres thinned to date}}{\text{unit/sub item acres}} \times 100 = \% \text{ work accomplished}$$
j	Contract number for reference
k	Name of contractor's inspector when the contractor is conducting the inspection.
l	% of contract time left: useful if this is a midway quality evaluation. $$\frac{\text{Contract time used to date}}{\text{Total contract time}} \times 100 = \% \text{ contract time left.}$$
CONTRACT SPECIFICATIONS- this is only a highlight of some of the requirements of the project; refer to the prescription and contract requirements for the additional information.	
m	Acceptable stocking density in trees per acre provided in the prescription. An average, minimum, and maximum are provided.
n	Acceptable trees per plot is calculated from the acceptable trees per acre based on plot size. Calculate the minimum, maximum, and average. The minimum and maximum are required for evaluating trees on the plot. Trees /ac x plot size = trees/plot Example: 250 trees/ac x 1/50th ac plot = 5 trees/plot
o	Spacing when spacing method is used for leave tree selection. Refer to prescription. Example: 10 x 10 foot average spacing.
p	Plot size is either specified in the contract or determined by inspector. The same plot size must be used on the entire unit; it should yield a minimum of 4-6 trees per plot (fully stocked plots). Utilize larger plot when variability in the stand density exists and it is desired to maintain that variability.
q	Minimum cut height is stated in the prescription/contract and reflects the shortest tree that is required to be cut, represented in inches of height from ground level.
r	Maximum cut d.b.h. is stated in the prescription and reflects the maximum d.b.h. for trees to be cut. Cutting trees larger is a violation.
s	Maximum Cat C is the maximum allowable Category C deficiencies allowed before rework is required. The maximum is stated in the prescription or contract.
PLOT INSPECTION	
HEADER INFORMATION BLOCK	**EXPLANATION**
t (bottom of page)	Thinning Quality calculation: ratio of Category A and B deficiencies to total satisfactory leave trees and credit for non-stocked points. $$\text{Quality \%} = 1.00 - \frac{\text{Totals of col. } 6 + \text{col. } 7 + \text{col. } 8 + \text{col. } 9}{\text{Col } 3 + \text{Col. } 5} \times 100$$ Note: if there are a high number of deficiencies relative to allowable trees, the quality may be a negative number. This would indicate a need for re-work or other action to achieve acceptable work.

	Category C deficiency calculation after Cat C deficiencies are totaled on the unit Cat C trees per acre = $\underline{\text{Total col. 10}}$ x reciprocal of plot size = tpa No. of plots
Bottom of page	Contractor inspector must sign, date and certify that all information is correct and accurate before providing the records to the Government.

INSPECTION SHEET COLUMN	INSTRUCTIONS/EXPLANATIONS
1	Locate and mark plot center on the ground. Record the plot number in column 1.
2	• Locate and examine each tree on the plot selected for leave, and trees that have been cut. Record the Evaluation Code on the upper row of blocks for each tree on the plot, any tree that should have been left on the plot, and non-stocked points. Utilize the Tree Evaluation Codes on the back of the form. Do not include trees with a C deficiency (see column 10). • If required by the contract, record the species of each tree in the lower block. Record the species of a tree that was cut that should not have been with a diagonal line through it. • If required by the contract, estimate and record the average diameter and height of the trees after thinning the plot. These are estimates that can be used for the post-thinning stand condition. • In the remarks area, provide comments on tree condition, plot conditions, or other information useful to understand the inspection results
3	Based on the results of column 2, tally the satisfactory S1 and S2 leave trees on each plot and record in column 3. This number cannot exceed the maximum trees per plot (block n) and would only be less than the minimum when there are non-stocked points (N1, N2) or Category A deficiencies recorded on the plot. If this number is not within the max/min range, then the codes in column 2 need to be re-evaluated. When it exceeds the maximum, there are trees coded satisfactory that should be surplus (S3 or S4) or excess (Cat B). If it is below the minimum, and there are no points that satisfy the definition for non-stocked points (N1, N2), then an acceptable tree was cut (Cat A). The appropriate tree(s) should be re-coded. If an entire plot consists of trees which exceed the max. dbh, or in combination with Satisfactory (S1) trees, the maximum satisfactory leave trees in column 3 is the maximum trees/plot (block n).
4	Based on the results of column 2, tally the number of acceptable trees left because they exceeded the maximum d.b.h. (S3); or were trees that were ignored during the thinning (S4). These trees are surplus to those on the plot used in the acceptable trees per plot calculation based on 1) the prescription or 2) because these are in addition to the maximum acceptable trees per plot. This column is not used in the quality calculation however is useful in evaluating total trees remaining on the unit of all size classes.

COLUMN	INSTRUCTIONS/EXPLANATIONS
5	Tally the non-stocked points on the plot (N1, N2). If the entire plot is an opening, the maximum number of N1 credit is the minimum acceptable trees/plot from block (n).
6	Tally the total of trees cut that should not have been cut (A1, A2).
7	Tally the total trees that should have been left but were damaged during the operation (A3) or an error in selecting the correct leave tree (A4), hence the best or correct tree was cut.
8	Tally of excess trees which are trees that should have been cut (B1, B2) and cause there to be more trees per acre than acceptable, trees that are spaced too close to a satisfactory leave tree, or trees that should have been cut to meet contract specifications. Poor thinning quality can be improved by reworking areas with excess trees.
9	Tally of trees that should have been girdled or pruned or were done so incorrectly (B3 and B4). Poor quality can be improved by reworking areas with excess trees. Note that excess girdled or pruned trees could instead be a Category C deficiency. The FS must determine this prior to start work; specify on back of inspection form.
10	Tally other types of deficiencies on the plot. Tally by type of error utilizing the space

	below column 10. A maximum number of C deficiencies must be identified prior to start work (refer to prescription or contract). Areas that exceed this level, must be re-worked. Refer to explanation for block s. Category C deficiencies are not included in the quality calculation.

After all plots are taken, total the columns. Calculate thinning quality and determine if the Category C deficiencies are within the contract allowance. .

Thinning Quality (see block t)

$$\text{Quality \%} = 1.00 - \frac{\text{Totals of Column 6 + column 7 + Column 8 + Column 9}}{\text{Column 3 + Column 5}} \times 100$$

Note: if the numerator exceeds the denominator, a negative thinning quality will result.

$$\text{Category C trees per acre} = \frac{\text{Total of Column 10}}{\text{No. of plots}} \times \text{reciprocal of plot size}$$

Compare results with blocks.

Additional calculations that may be conducted by the Government to determine if thinning met the prescription goals.

Average number of satisfactory leave trees (S1 and S2 only) per plot:

$$\frac{\text{Sum of Column 3}}{\text{No. of plots}} = \text{avg. trees /plot}$$

Average number of satisfactory trees (S1, S2 only) per acre:

$$\frac{\text{Sum of Column 3}}{\text{No. of plots}} \times \text{reciprocal of plot size} = \text{trees per acre}$$

Average trees per acre in the diameter range being thinned (S1, S2, A3, A4, B1, B2 trees):

$$\frac{[\text{Sum of Columns 3 + 7+8}]}{\text{No. of plots}} \times \text{reciprocal of plot size} = \text{trees per acre}$$

Average trees per plot in the diameter range being thinned:

$$\frac{[\text{Sum of Columns 3 +7+8}]}{\text{No. of plots}} = \text{avg. trees /plot}$$

Average Total trees per acre (all trees larger than "small trees" and min. cut tree height):

$$\frac{[\text{Sum of Columns 3 + 4 + 6 + 7 + 8}]}{\text{No. of plots}} \times \text{reciprocal of plot size} = \text{trees per acre}$$

THINNING INSPECTION PLOT FORM

page _1_ of _1_

ID	(a) Forest *Green NF*	(b) District *Too Dense RD*	(c) Stand # *256-006*	(d) Inspector (Gov't) *I.M.Thin*	(e) Date *7/20/03*

Contract	(f) Contractor *I.M.Verigood*	(g) Sub-item # *1.1*	(h) Acres *20*	(i) % of Work Accomplished *100*	
	(j) Contract # *32789-00*	(k) Contract Inspector *F.M. Pay*		(l) % of Contract Time Left *10%*	

Contract Specifications	(m) Acceptable tpa *250* min/ *350* max *300* avg.	(n) Accept. Trees/plot *5* min/ *7* max *6* avg.	(o) Spacing *12* x *12* feet	(p) Plot Size 1:___ or 1/ 50ᵗʰ acre	(q) Min. Cut Ht *24* in.	(r) Max. cut dbh *5* in.	(s) Max. Cat C 15 tpa

				SATISFACTORY			DEFICIENCY				
Plot No. (1)	Code / Species — Tree Evaluation and Species; Species ? Tree was cut — Codes ? (2)			Satisfactory Leave Trees S1-S2 (3)	Surplus Trees S3-S4 (4)	Non-stocked points N1-N2 (5)	Cat."A" trees Improper Leave Tree Selection (Uncorrectable) A1-A2 (6)	A3-A4 (7)	Cat."B" trees Excess (Correctable) B1-B2 (8)	B3-B4 (9)	Cat."C" trees (Correctable) C1-C6 (10)

Plot 1

	1	2	3	4	5	6	7	8	9	10	11	12	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	S1	S1	S2	S2	S1	S1	S1	B1					7					1		
	LP	LP	PP	PP	LP	LP	LP	LP					Avg D.B.H. = 2.5";		Avg HT = 15'		Cat. C tally:			

Remarks:

Plot 2

	S1	S2	S2	S2	S3	S1	S1	S1	C3				7	1						1
	LP	PP	LP	LP	LP	PP	PP	LP	LP				Avg D.B.H. = 3.0";		Avg HT = 17'		Cat. C tally: C3 = 1			

Remarks:

Plot 3

	S1	S2	N1	N1	N1	N1							2		4					
	LP	PP											Avg D.B.H. = 3.5";		Avg HT = 20'		Cat. C tally:			

Remarks: *small meadow*

Plot 4

	S1	S1	S1	S1	S1	N1							5		1					
	PP	PP	LP	LP	PP								Avg D.B.H. = 2.5";		Avg HT = 15'		Cat. C tally:			

Remarks:

Plot 5

	S1	S1	A2	S1	S1	S1							5			1				
	PP	PP	PP	LP	PP	PP							Avg D.B.H. = 3.0";		Avg HT = 12'		Cat. C tally:			

Remarks:

Plot 6

	S1	S2	B1	S1	S2	B2	S1						5					2		
	LP	PP	LP	PP	PP	LP	LP						Avg D.B.H. = 3.0";		Avg HT = 15'		Cat. C tally:			

Remarks:

Plot 7

	S1	S2	S1	A1	N1								3	1	1					
	PP	PP	PP	PP									Avg D.B.H. = 3.0";		Avg HT = 10'		Cat. C tally:			

Remarks:

Plot 8

	S1	S1	S1	S1	N2	S4	S4	S4					4	3	1					
	LP	DF	PP	LP		AS	AS	AS					Avg D.B.H. = 3.0";		Avg HT = 12'		Cat. C tally:			

Remarks:

Plot 9

	S2	S2	S2	S2	S2	S2	S2	S3	S3				7	2						
	LP	PP	PP	LP	LP	PP	PP	PP	LP				Avg D.B.H. = 5.0";		Avg HT = 25'		Cat. C tally:			

Remarks:

Plot 10

	S1	S1	S2	S1	S2	S2	C1						6							1
	LP	LP	PP	PP	LP	PP	PP						Avg D.B.H. = 3.5";		Avg HT = 10'		Cat. C tally: C1 = 1			

Remarks:

(t) Thinning Quality Calculation	Totals of this page	51	6	7	2	0	3	0	2
	Total of all pages	51	6	7	2	0	3	0	2
		(3) Accept Leave	(4) Surplus	(5) Non-stocked	(6) Cat A	(7) Cat A	(8) Cat B	(9) Cat B	(10) Cat C

$$1- \quad \frac{Cat\ A\ (2+0)\ +\ Cat\ B\ (3+0)}{Accept\ Leave\ (51)\ +\ Non\text{-}stocked\ (7)} = .914 = 91\%$$

$Cat\ C = 2\ trees\ x(1/10\ plots)\ x\ (50/1) = 10\ trees/ac$

Submitted by: *Igor M. Thin, Inspector 7/20/2003   All information is correct and accurate.*

Note that the Contractor filled out the Inspection Sheet header completely. The Forest, District, Stand number, Sub-item, Acres, Contract # and all items in the Contract Specification row are provided by the Government either directly or within the Contract.

The Contractor provided the name of the Contractor, Contractor Inspector, % work accomplished, % contract time left, sheet number, date, and calculated the final quality and the Category C trees per acre. The Contractor assured that all columns and math were done correctly. The Contractor's Inspector signed and dated the inspection record and certified that the information was correct and accurate.

The plot information on the sample Inspection sheet was based on the following observations:

On each plot, the Contract required species to be recorded for each trees and an estimate of average leave tree dbh and average height. The Contractors observations are recorded in the second row of each plot.

Plot 1: This plot has seven satisfactory leave trees and one deficiency. Five satisfactory leave trees are within the thinning diameter range (S1), and two are above the maximum dbh (S2) and based on the prescription are included in the acceptable trees/plot determination. Additionally a tree within the thinning range was left which should have been cut to meet the maximum allowable density (B1)

Plot 2: The plot has eight satisfactory leave trees and one deficiency. Four of the eight were satisfactory leave trees are in the thinning diameter range (S1) and four were larger than the maximum dbh. Since a maximum of seven satisfactory leave trees is allowed per plot, three trees are recorded as S2 and counted in the acceptable trees/plot calculation and one tree is recorded as S3, and considered surplus. Surplus trees, while satisfactory leave trees, are not counted in the acceptable trees/plot calculation. Additionally, one cut tree had a high stump (C3).

Plot 3: The plot has two satisfactory leave trees (S1, S2) and over half of the plot is a meadow with no trees. Three non-stocked points (N1) are recorded which brings the totals of S1, S2 and N1 to the minimum acceptable trees/plot.

Plot 4: This plot has five satisfactory leave trees (S1), and one large area, about 20% of plot where no trees exist (and none were cut) thus there is credit for one non-stocked points (N1). Had there not been an obvious void on the plot, then there would not have been credit for non-stocked points since the minimum acceptable tree/plot was met.

Plot 5: The plot has five satisfactory trees (S1), and one tree that was cut that was above the maximum dbh to cut and should not have been cut resulting in a A2 deficiency.

Plot 6: This plot has seven leave trees however only five are satisfactory leave trees. Of the leave trees, two were too close together (closer than the contract specification of 50% spacing variance) thus one tree is coded as a B1 deficiency, the other S1. Additionally, one tree was left with heavy mistletoe brooms and by contract specifications should not have been left; it is recorded as a B2 deficiency.

Plot 7: This plot has three satisfactory leave trees. There is a large void on the plot and the inspector found that one tree was cut that met leave tree specifications and was needed to meet the minimum trees/plot specification thus recorded one A1deficiencies. Additionally one non-stocked point is recorded (N1) where no trees existed.

Plot 8: This plot has seven leave trees. Four were satisfactory leave trees in the diameter range for thinning (S1) and there was a clump of three aspen trees that based on the prescription were to be left (ignored) and not counted in the acceptable trees per plot calculation (S4). Additionally one tree had a high level of mistletoe and was cut (appropriately) even though it created a "hole" in the plot; a credit N2 is recorded.

Plot 9: This plot had nine satisfactory trees on the plot because they were all above the maximum dbh to cut. Since the maximum density is seven trees per plot, only seven trees are recorded as S2 and counted in the trees per plot calculation based on the prescription and two are considered surplus trees (S3).

Plot 10: This plot has six satisfactory leave trees, three are in the range for thinning (S1) and three exceed the max. dbh to cut and based on the prescription are considered in the acceptable trees per plot calculation (S2). Additionally one cut tree was not severed from the stump completely resulting in a C1 deficiency.

Calculate Totals.

$$\text{Quality \%} = 1.00 - \frac{\text{Cat A deficiencies (col. 6 + col. 7)} + \text{Cat B deficiencies (col. 8 + col. 9)}}{\text{Acceptable Leave (col. 3)} + \text{Non-stocked points (col. 5)}} \times 100$$

$$\text{Quality \%} = 1.00 - \frac{(2+0) + (3+0)}{51 + 7} \times 100 = 91.4\%$$

$$\text{Category C deficiencies per acre} = \frac{\text{Total Cat C (col.10)} \times \text{reciprocal of plot size}}{\text{No. of plots}}$$

$$\text{Cat. C deficiencies per acre} = \frac{2}{10} \times \frac{50}{1} = 10 \text{ trees/acre}$$

Since the Thinning Quality % is 90% or above AND the Category C deficiencies are below the maximum of 15 per acre allowed, the Contractor would receive full pay less other deductions.

Example of additional evaluations that can be conducted to evaluate if other conditions are met.
a.   Total Satisfactory leave trees (S1 and S2) trees per acre

$$\frac{\text{Sum col 3}}{\text{No. of plots}} \times \text{reciprocal of plot size} = \frac{51}{10} \times 50 = 255 \text{ trees / ac}$$

b.   Total of all trees per acre (excl. any small trees left on unit and trees below min. cut height).

$$\left(\frac{\text{Sum of col 3 + 4 + 6 + 7 + 8}}{\text{No. of plots}}\right) \times \text{reciprocal of plot size} = \frac{(51 + 6 + 2 + 0 + 3)}{10} \times 50 = 310 \text{ trees /ac}$$

 Sample evaluation: The contract was developed to achieve a range of 250 to 350 trees per acre of desirable crop trees and included trees 5" dbh and greater (up to a maximum 350 tpa) in the range. Based on the above density calculations, the prescription goals were met. There are several natural openings in the stand and several desirable trees that were cut ("A trees") that caused the total satisfactory leave trees per acre to be near the lower bounds of the acceptable level (355 vs. 350 minimum). The total of all trees left includes those left even if they were damaged (A4) or excess (B trees) and or surplus (S3, S4), resulting in 310 tpa, also within in the acceptable range, although it includes trees that are not desirable for future crop trees but are now part of the growing stock.   Additional analysis should consider the distribution, species composition and other prescription objectives to determine if the overall thinning goals were met.